

REMARKS

This document is filed in reply to the Office Action dated May 5, 2006 ("Office Action").

Applicants have (i) cancelled claims 1-19, 44, and 45 and (ii) added new claims 46-60.

Support for the new claims can be found in the original claims or specification. Examples of the support are listed in Table 1 below.

Table 1. Support for New Claims

New Claims	Support
Claim 46	
Part (i)	the specification, pages 5-6, carryover paragraph; and original claim 1
Part (ii)	the specification, page 2, lines 15-19
Claims 47 and 51	original claim 2
Claims 48 and 52	original claim 3
Claim 49	the specification, pages 5-6, carryover paragraph
Claim 50	
Part (i)	original claim 1
Part (ii)	the specification, pages 5-6, carryover paragraph; and original claim 1
Part (iii)	the specification, page 2, lines 15-19
Claims 53 and 54	the specification, pages 5-6, carryover paragraph
Claims 55-60	original claims 8-9

In particular, the specification, at pages 5-6, carryover paragraph, describes a process of preparing extracts from a tuber of a *Dioscorea* plant. The process includes mixing *Dioscorea* tuber powder with water to produce a water-soluble crude extract (CE) fraction. The soluble CE fraction was further extracted stepwise with an aqueous solution 50%, 75%, and 87.5% ethanol to generate ethanol-insoluble fractions. For the Examiner's convenience, Applicants have attached a flow chart of this process ("Exhibit A"). Specifically, CE was first extracted with an aqueous solution containing 50% ethanol. The resulting insoluble fraction was collected and designated as "DsCE-I." The soluble fraction was then extracted with an aqueous solution containing 75% ethanol to generate a second insoluble fraction ("DsCE-II") and a second soluble fraction. The second soluble fraction was further extracted with an aqueous solution containing 87.5% ethanol in the same manner to generate a third insoluble fraction, "DsCE-III." In view of

the process, it is clear that all of DsCE-I, DsCE-II, and DsCE-III are “soluble in both water and an aqueous solution containing 50% ethanol” (i.e., part (i) of claim 46). Also, it is clear that DsCE-II contains compounds “insoluble in an aqueous solution containing 75% ethanol” (i.e., the limitation recited in claim 49); that DsCE-I and DsCE-III are free of compounds in DsCE II, i.e., “free of compounds that are both soluble in an aqueous solution containing 50% ethanol and insoluble in an aqueous solution containing 75% ethanol” (i.e., part (ii) of claim 50); and that DsCE-III contains “compounds that are soluble in an aqueous solution containing 75% ethanol” (i.e., a limitation recited in claim 53) and “compounds are insoluble in an aqueous solution containing 87.5% ethanol” (i.e., a limitation recited in claim 54). No new matter has been introduced.¹

Upon entry of the above amendments, claims 20-38, 41-43, and 46-60 will be pending. Among them, claims 20-38 and 41-43 have been withdrawn from further consideration for covering a non-elected invention. Claims 46-60 will be under examination. Reconsideration of this application is requested in view of the following remarks.

Restriction Requirement

The Examiner requested withdrawal of claims 44 and 45, asserting that these two claims “are directed to processes of making the extract of claim 1.” See the Office Action, page 2, lines 6-8.

Applicants disagree. Contrary to the Examiner's assertion, both claims are drawn to “extracts,” prepared by a specific process. See the preambles. Indeed, they are the so-called “product-by-process” claims. According to MPEP 2137.05(p), “[a] product-by-process claim, ... is a product claim that defines the claimed product in terms of the process by which it is made...” However, in the sole interest of moving this case toward allowance, Applicants have cancelled these two claims.

¹ A claim limitation does not have to be set forth verbatim in the specification. In *In re Wright*, 9 USPQ2d 1649 (Fed. Cir. 1989), the Federal Circuit, in reversing a Board's 35 U.S.C. § 112, first paragraph rejection, held that there was adequate written description support for applicant's claim limitation, despite the fact that it was not set forth “*in haec verba*” (i.e., “in these words” or “verbatim”) in the specification.

Rejection under 35 U.S.C. § 112, first paragraph

The Examiner rejected claims 1-6, 8-9, 11-12, 14-15, and 17-18 for not complying with the written description requirement. It is her position that “[t]he claim(s) contains subject matter which was not described in the specification in such a way to reasonably convey to one skilled in the relevant art that the inventor(s), at the time of the application was filed, had possession of the claimed invention.” See the Office Action, page 3, lines 8-12.

Applicants have cancelled all of the rejected claims and will address the written description requirement for new claims 46-60. Independent claims 46 and 50 are discussed first.

Claim 46 covers an extract prepared from a tuber of the genus *Dioscorea*. The extract (i) is soluble in both water and an aqueous solution containing 50% ethanol between 0°C and 25°C and (ii) has an activity to enhance the proliferation of bone marrow or spleen cells. It is the Examiner’s position that,

The MPEP states that written description for genus can be achieved by a representative number of species within a broad generic. It is unquestionable that [the] claims [at issue] are broad generic claims, with respect to *all possible* extracts from any species of *Dioscorea*. The possible variations of extracts (i.e., their inherent phytochemical constituents) are limitless to any extract which meets the limitations of being soluble in water and insoluble in an aqueous solution containing varying amounts of ethanol between certain temperatures. The specification lacks sufficient variety of extracts of species of the *Dioscorea* genus to reflect this variance in since the specification does not provide any other examples of extracts besides *D. batatas* which provide for the claimed characteristics. This is further evidenced by the fact that *Dioscorea* genus comprises around 500 species (see University of Florida internet site, page 1).

See the Office Action, pages 5-6, carryover paragraph, emphasis added.

Applicants note that, contrary to the Examiner’s statement, the specification does provide “other examples of extracts besides *D. batatas* which provide for the claimed characteristics.” More specifically, the specification teaches for different species: “[t]hree species of the genus *Dioscorea* (*D. batatas* Decne, *D. alata*, L. and *D. pseudojaponica*) and one cultivar of *D. alata* (*D. alata* L. var. *purpurea* (Roxb.) M. Pouch.) ...” See page 5, lines 25-28. In view of this fact, the Examiner’s position is clearly not tenable.

Judging from the above quoted paragraph from the office action, it appears to be the

Examiner's position that the specification does not provide extracts from "representative number of species within" the "around 500 species" of the *Dioscorea* genus. Applicants would like to point out that

[w]hat constitutes a 'representative number' is an inverse function of the skill and knowledge in the art. Satisfactory disclosure of a 'representative number' depends on whether one of skill in the art would recognize that the applicant was in possession of the necessary common attributes or features of the elements possessed by the members of the genus in view of the species disclosed."

See MPEP 2163IIA3aⁱⁱ. *Dioscorea* is a genus of plants well known in the art of herb medicine and food. This is evidenced by two references cited by the Examiner, i.e., the University of Florida internet site and Hikino *et al.* One skilled in the art would know common attributes or features of the elements possessed by the members of the genus. In addition, the specification teaches how to prepare the claimed extract from four different species of the *Dioscorea* genus and described the "necessary common attributes or features of the elements possessed" by the extracts. See, e.g., the specification, page 1, lines 9-16. Therefore, Applicants submit that the four species constitute a representative number of the genus.

Of note, the law does not require that Applicants provide extracts prepared from all of the around 500 species. Indeed, according to MPEP, *supra*, "[d]escription of a representative number of species does not require the description to be of such specificity that it would provide individual support for each species that the genus embraces." In addition, MPEP provides the following guidance as to meeting the written description requirement for a claimed genus:

The written description requirement for a claimed genus may be satisfied through sufficient description of a representative number of species by actual reduction to practice ..., reduction to drawings ..., or by disclosure of relevant, identifying characteristics, i.e., structure or other physical and/or chemical properties, by functional characteristics coupled with a known or disclosed correlation between function and structure, or by a combination of such identifying characteristics, sufficient to show the applicant was in possession of the claimed genus ... (See MPEP 2163 IIA3(a) ii)

Here, the specification discloses a number of extracts prepared from four different *Dioscorea* species that were actually reduced to practice. As discussed above, the specification furberishes a

number of identifying characteristics of the claimed extract. Thus, it is submitted that the specification is "sufficient to show the applicant was in possession of the claimed genus" and that independent claim 46 meets the written description requirement.

Independent claim 50 covers an extract from a tuber of a *Dioscorea* plant. The extract (i) is soluble in water between 0°C and 25°C, (ii) is free of compounds that are both soluble in an aqueous solution containing 50% ethanol and insoluble in an aqueous solution containing 75% ethanol between 0°C and 25°C, and (iii) has an activity to enhance the proliferation of bone marrow or spleen cells. For the same reasons set forth above, claim 50 also meets the written description requirement. So are claims 47-49 and 51-60, all of which depend from claim 46 or 50, or are drawn to compositions containing the extract of claim 46 or 50.

Rejection under 35 U.S.C. § 102(b)

The Examiner rejected claims 1-10 for lack of novelty on two grounds. Applicants will discuss each below.

I

The Examiner rejected claims 1-7, covering *Dioscorea* extracts, for being anticipated by Hikino *et al.* (Abstract of JP 61106516A; "Hikino"). See the Office Action, page 6, lines 14-15.

Applicants have canceled claims 1-7 and added new claims 46-54. The novelty of the new claims will be addressed below in view of Hikino. Independent claims 46 and 50 will be discussed first.

As mentioned above claim 46 is drawn to an extract from a tuber of a *Dioscorea* plant that is soluble in both water and an aqueous solution containing 50% ethanol ("50% ethanol") between 0°C and 25°C. Namely, the extract of claim 46 does not contain matter insoluble in 50% ethanol.

Hikino teaches preparing a polysaccharides-containing extract from a *Dioscorea* plant by extraction with water and then by precipitation with "4-6 fold of ... etOH." See the abstract, lines 9-11. It follows that the extract is insoluble in etOH:water of 4:1 to 6:1, i.e., 80% to 85.7% ethanol. According to the Examiner,

it is deemed that the extract which was disclosed by Hikino et al. would inherently contain all ethanol insoluble matter from less than 1% to [85.7]% ethanol. In other words, extracts which are insoluble in 50% - 75% and 65% - 75% ethanol, will inevitably be present in an extract performed with 80 – [85.7]% ethanol because the less insoluble matter will precipitate with the higher amount (80 – [85.7]%) of alcohol added to the water extract of *D.batatas*.

See the Office Action, page 7, lines 5-10; emphasis added. In other words, the extract described in Hikino contains all matter insoluble in 50% ethanol. As mentioned above, the extract of claim 46 does not contain matter insoluble 50% ethanol. Thus, the extract of claim 46 differs from that taught in Hikino.

Claim 50 is drawn to an extract from a tuber of a *Dioscorea* plant. This extract is “free of compounds that are both soluble in an aqueous solution containing 50% ethanol and insoluble in an aqueous solution containing 75% ethanol (‘75% ethanol’).” Put differently, the claimed extract does not contain all of the matter that is insoluble 75% ethanol. As acknowledged by the Examiner, “the extract which was disclosed by Hikino et al. would inherently contain all ethanol insoluble matter from less than 1% to [85.7]% ethanol. In other words, extracts which are insoluble in 50% - 75% and 65% - 75% ethanol, will inevitably be present in” the extract described in Hikino. Thus, the Hikino extract differs from that of claim 50.

In view of the above remarks, Applicants submit that claims 46 and 50 are novel over Hikino. So are claims 47-49 and 51-54, all of which depend from claim 46 or 50.

II

The Examiner rejected claims 8-10, drawn to compositions containing *Dioscorea* extracts, for being anticipated by an abstract by Su *et al.* (“Su”). See the Office Action, page 7, lines 14-15.

Applicants have replaced claims 8-10, as well as claims 11-19, with new claims 55-60. Independent claim 55 is discussed first. Claim 55 is drawn to a composition including an extract from a tuber of a *Dioscorea* plant and an active cytokine.

The Examiner correctly pointed out that Su “disclosed extracts from Chinese yam (aka *D. batatas*) which were combined with Il-2 for enhancing proliferation of Tcells for example (Tcells are bone marrow cells because they are found in bone marrow).” See the Office Action, page 7, last paragraph.

However, Applicants would like to bring to the Examiner's attention that Su does not qualify as an anticipating reference. More specifically, Su fails to provide an enabling disclosure for a method of making the extract recited in claim 55. For example it does not teach specific extract solvents, temperatures, or steps for preparing the extract as taught in the specification. Indeed, the specification teaches extracting a tuber of a *Dioscorea* plant at room temperature or lower, which is not mentioned in Su at all. Rather, Su, at lines 1-2, teaches that *Dioscorea* "has long been used as an ingredient of traditional Chinese medicine," yet it is well known in the art of traditional Chinese medicine that herbs are routinely boiled for hours to extract therapeutic ingredients. Thus, one skilled in this art, in view of Su, would have not extracted a tuber of a *Dioscorea* plant at room temperature or lower and, thereby, would not be able to prepare the extract recited in claim 55, much less the composition of claim 55.

In this connection, Applicants would like to point out that, according to MPEP § 2121.01, "[t]he disclosure in an assertedly anticipating reference must provide an enabling disclosure of the desired subject matter." The desired subject matter here is the composition of claim 55. The test of an enabling reference against a claimed product was elaborated in *In re Houseman*, 399 F.2d 269, 158 USPQ 597 (CCPA 1968). The *Hoeksema* court pointed out that if the prior art of record does not disclose or suggest a method of making a claimed compound, this reference does not provide an enabling disclosure on the compound. Specifically, according to the *Hoeksema* court:

"In determining that quantum of prior art disclosure which is necessary to declare an applicant's invention "not novel" or "anticipated" within section 102, the stated test is whether a reference contains an "enabling disclosure[.]" ... **[T]he true test of any prior art relied on to show or suggest that a chemical compound is old, is whether the prior art is such as to place the disclosed 'compound' in the possession of the public.** ... [I]t is our view that **if the prior art of record fails to disclose or render obvious a method for making a claimed compound,** at the time the invention was made, it may not be legally concluded that the compound itself is in the possession of the public." *Id.* 601; emphasis added.

As mentioned above, Su fails to provide an enabling disclosure for a method of making the extract recited in claim 55. Following the reasoning of the *Hoeksema* court, it does not "place the disclosed [extract or composition] in the possession of the public" and therefore

cannot be “relied on to show or suggest that [the extract or composition] is old.” In other words, Su does not anticipate claim 55.

Independent claim 58, like claim 55, is also drawn to a composition including an extract from a tuber of a *Dioscorea* plant and an active cytokine. For the same reasons set forth above, claim 58 is also not anticipated by Su. So are claims 56, 57, 59, and 60, all of which depend from claim 55 or 58.

Rejection under 35 U.S.C. § 103(a)

The Examiner rejected claims 1-19 as obvious over Su. See the Office Action, page 8, lines 9-10. Su teaches combining an extract of *Dioscorea* with 11-2 and using the mixture to enhance proliferation of T cells. It is the Examiner's position that

It is deemed that the active ingredient which displays enhancement of splenocytes was present in the ethanol-insoluble extracts of Chinese yam as disclosed by [Su] et al. Thus, it was already known in the art that the ethanol-insoluble portion of the water extract of *D.batatas* contained the active ingredient. One of ordinary skill in the art would have been motivated to further elucidate (purify) the active ingredient in order to create a substantially pure product free of non-actives. This would have been especially useful for properly diluting the active ingredient to varying dosage forms and eliminating unwanted side effects of other endogenous ingredients.

See the Office Action, page 9, second paragraph. As such, the Examiner concluded that claims 1-19 are obvious over Su.

Applicants have replaced claims 1-19 with new claims 46-60 and will address non-obviousness of the new claims. Independent claims 46 and 50 are discussed first. These two claims cover extracts prepared from a tuber of a *Dioscorea* plant. As discussed above, the extracts have specific solubility characteristics. Indeed, the Examiner agreed that “[Su] et al. did not discuss [these solubility characteristics].” See the Office Action, page 8, lines 11-13. In this connection, Applicants note that “[t]o establish a prima facie case of obviousness, ... the prior art reference (or references when combined) must teach or suggest all the claim limitations.” See MPEP 2143. Here, Su is silent on the solubility characteristics recited in claim 46 or 50. Thus, it does not render these two claims obvious.

MPEP 2143 further provides that “[t]o establish a prima facie case of obviousness, ... there must be a reasonable expectation of success.” As discussed above, Su fails to provide an enabling disclosure for a method of making the claimed extracts. For example, it does not teach specific extract solvents, temperatures, or steps as disclosed in the specification. In view of Su, one skilled in the art of herb medicine therefore would not have been able to prepare the extract of claim 46 or 50 with a reasonable expectation of success. Thus, Applicants submit that Su does not render claim 46 or 50 obvious on this additional and independent ground.

For the above reasons, Applicants submit that claims 46 and 50 are non-obvious over Su. So are claims 47-49 and 51-60. All of these claims either depend from claim 46 or 50, or cover compositions containing the extracts of claim 46 or 50.

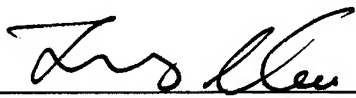
CONCLUSION

Applicants submit that grounds for rejection asserted by the Examiner have been overcome, and that claims, as pending, define subject matter that is patentable. It is therefore submitted that allowance of this application is proper, and early favorable action is solicited.

Applicants enclosed a Petition for One Month Extension of Time. The fees in the amount of \$60 are being paid concurrently on the Electronic Filing System (EFS) by way of Deposit Account authorization. Please apply any other required fees to deposit account 06-1050, referencing the attorney docket number shown above.

Respectfully submitted,

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Exhibit A

